BLUEPRINT FOR THE CANADIAN REGISTERED SAFETY PROFESSIONAL EXAMINATION (CRSPEX)

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PREFACE

The Board of Canadian Registered Safety Professionals (BCRSP) is pleased to present the *Blueprint for the Canadian Registered Safety Professional Examination* (CRSPEX). Administration of the first examination developed from the new Blueprint is targeted for **February 2021**.

The Blueprint was developed to guide those involved in the development of the *Canadian Registered Safety Professional Examination* and to provide the public (e.g., examinees, educators, administrators) with practical information about the examination.

The Blueprint has two major components: (1) the content domain to be measured and, (2) the explicit guidelines on how this content is to be measured. The content domain consists of the CRSPEX set of competencies (i.e., the competencies expected of registered safety professionals), and the guidelines are expressed as structural and contextual variables. The Blueprint also includes: a *Summary Chart* (p.10) that summarizes the examination guidelines; a *Glossary* (p. 11) that provides definitions of terms appearing in bold throughout the document.

BCRSP wishes to thank all the individuals who have contributed to the creation of this Blueprint. In particular, thanks are extended to registered safety professionals across Canada who responded to the competency validation survey.

A comprehensive review of this second edition of the *Blueprint for the Canadian Registered Safety Professional Examination* is planned for 2024. In addition, the Blueprint will be evaluated annually to reaffirm that the competencies and the guidelines for examination development continue to reflect what is expected of a registered safety professional.

BCRSP encourages all users of this document to provide feedback which may be useful in future revisions of the Blueprint. Please forward all such comments to:

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INTRODUCTION

The Board Canadian Registered Safety Professionals develops the Canadian Registered Safety Professional Examination (subsequently referred to as the CRSPEX) for registering purposes. It fulfills this service by working in collaboration with Canadian Registered Safety Professionals (CRSP's) from across Canada who serve as the content experts in developing and validating the examinations.

Registration/licensure/certification examinations have a well-defined purpose: to protect the public by ensuring that those who are licensed possess sufficient knowledge and skills to perform important occupational activities safely and effectively (Canadian Psychological Association, 1987). In the case of the CRSPEX, the purpose is to determine whether or not examinees are prepared to practice occupational health and safety, without risk to the public and to the environment.

The purpose of this Blueprint is to describe how the examination is to be developed.

The primary function of the Blueprint for the Canadian Registered Safety Professional Examination is to describe how the examination is to be developed. Specifically, this Blueprint provides explicit instructions and guidelines on how the **competencies**[1] (e.g., knowledge, abilities, skills, attitudes, and judgment) are to be expressed within the examination in order for accurate decisions to be made on the ability of examinees to practice safely and effectively.

Prior to producing this Blueprint, BCRSP undertook an extensive study to identify the competencies required for the safe and effective practice of registered safety professionals in Canada. Individual registered safety professionals from across the country were active participants in all phases of the investigation, which served to identify and validate a comprehensive set of 77 competencies expected of the registered safety professional. With this set of competencies, and the validation data obtained, the essential components of the CRSPEX could be clearly described.

The periodic and comprehensive review of the competencies measured by the CRSPEX assists the BCRSP in maintaining the validity of the CRSPEX, and to develop psychometrically sound and legally defensible registration examinations. Because of changes that occur in the practice of health and safety professionals, a validation study of the

competencies is conducted at least every five years, or as needed. In addition to the periodic

comprehensive review and validation study, the competencies are reviewed and evaluated annually by content experts.

[1] The terms appearing in bold are defined in the Glossary.

TECHNICAL SPECIFICATIONS

The following section presents the technical specifications that are to guide the development of the CRSPEX. In the first part, issues related to the competencies are addressed. The second part describes the guidelines to be followed in addressing the structural and contextual variables of the CRSPEX.

The CRSPEX is a **criterion-referenced examination**. That is, a fundamental component of the development of the CRSPEX is a comprehensive description of the content domain being measured. In the case of the CRSPEX, the content domain of interest consists of the competencies a registered safety professional is required to possess in order to practice safely and effectively. These competencies form the basis of the CRSPEX.

This section describes the competencies that were obtained as a result of the validation process, the way they have been grouped, and the manner in which they are to be sampled in the examination development process.

DEVELOPING THE SET OF COMPETENCIES

The competencies were evaluated by approximately 1960 Canadian Registered Safety Professionals.

As a starting point for developing a new set of competencies, a Committee on Competencies was formed that was representative of all areas of practice of registered safety professionals in Canada. This committee reviewed the current set of CRSP competencies along with other recent competency lists prepared for health and safety. Using these competency lists, the committee developed a preliminary national set of competencies, and a six-category classification to group these competencies. The competencies in this initial set were then evaluated by a sample of approximately 1960 Canadian Registered Safety Professionals (CRSP's), including practitioners, educators, and administrators, who were asked to rate each competency in terms of its applicability, importance and frequency for the registered safety professional. The Committee on Competencies reviewed the results of the survey. The CRSPEX set of Competencies has the primary purpose of providing the content domain for the examination.

COMPETENCY CATEGORIES

The initial classification of the competencies consisted of the following six categories defined below (the number and the percentage of competencies are indicated in parentheses following the category name):

1. Hazard and Risks: Identification and Assessment (6 competencies or 8% of the set of competencies)

2. Hazard and Risks: Controls and Mitigation (10 competencies or 13% of the set of competencies)

3. Health and Safety Management (27 competencies or 35% of the set of competencies)

4. Ethics, Professional Role and Function (9 competencies or 12% of the set of competencies)

5. Technical, Human and Social Sciences (14 competencies or 18% of the set of competencies)

6. Management Sciences (11 competencies or 14% of the set of competencies)

Some of the competencies could lend themselves to being placed in one or more of the categories, so these six categories should be viewed simply as an organizing framework. It should be recognized that the competency statements vary in scope, with some representing global activities and others more discrete and specific actions.

STRUCTURAL VARIABLES

There will be 190 to 210 operational multiple choice questions on the Canadian Registered Safety Professional Examination.

In addition to the specifications related to the competencies, other variables must be considered during the development of the CRSPEX. Structural variables include those characteristics that determine the general appearance and design of the examination. They define the length of the examination, the format/presentation of the examination questions (e.g., multiple-choice format). The weightings of the six categories are also included as structural variables.

- Examination Length and Format: The examination will consist of between 190 and 210 operational multiple-choice questions. With 77 competencies to measure and a sound sampling approach for these competencies, an examination of between 190 and 210 operational questions is sufficient to make both reliable and valid decisions about an examinee's readiness to practice safely and effectively.

- Question Presentation: The multiple-choice questions of the CRSPEX are presented in one of two formats, **case-based** or **independent** questions

- Item Taxonomy: Each question on the CRSPEX is classified into one of three categories adapted from Bloom's Taxonomy of Cognitive Abilities. More specifically, each question is categorized into either **knowledge/comprehension**, **application** or **critical thinking**.

The Canadian Registered Safety Professional Examination represents the different areas of practice of registered safety professionals.

CONTEXTUAL VARIABLES

In addition to structural variables, Contextual Variables: Contextual variables qualify the content domain by specifying the contexts in which the examination questions will be set (i.e., professional context).

It is recognized that practice environment of registered safety professionals can be any setting of circumstance within which occupational health and safety can be practiced. The competencies

assessed by the examination are not setting dependent. The practice environment will be specified when necessary.

In each setting, the CRSP may act as a consultant or as an in-house safety professional. This will be considered in forming the context of examination items.

COMPETENCY WEIGHTINGS

To ensure that the examination accurately reflects the profile of the registered safety professional, the competencies were weighted according to their relative importance and frequency based on the survey ratings and a quantitative review by content experts.

The CRSPEX Set of Competencies presents the competencies grouped on the basis of the ratings from the validation survey.

These weightings were used to establish the relative emphasis the competencies will receive on the examination. The competencies have been weighted using the importance and frequency ratings obtained in the competency validation study.

Based on the applicability, importance and frequency data extracted from the 2019 Competency Survey, and with the guideline that the CRSPEX will consist of between 190 and 210 questions, the sampling scheme presented in the table below was developed. The distribution of weights in this sampling scheme was selected: (1) to provide differentiation on the rating variables (importance and frequency); and (2) to conform with the examination length requirement. The following table presents the percentage range of questions in each of the six categories of competencies.

Competency Categories	Percentage of Questions on the CRSPEX
1. Hazard and Risks: Identification and Assessment	15 - 20%
2. Hazard and Risks: Controls and Mitigation	15 - 20%
3. Health and Safety Management	30 - 35%
4. Ethics, Professional Role and Function	10 - 15%
5. Technical, Human and Social Sciences	10 - 15%
6. Management Sciences	10 - 15%

CONCLUSION

The *Blueprint for the Canadian Registered Safety Professional Examination* is the product of a collaborative effort between BCRSP and Canadian Registered Safety Professionals (CRSP's). Their efforts have resulted in a compilation of the competencies required of the registered safety professional to practice and of the guidelines on how the competencies will be measured on the CRSPEX. A summary of these guidelines can be found in the CRSPEX Examination Development Summary Chart, on page 10.

It is recognized that the health and safety profession will continue to evolve. As this occurs, the Blueprint (i.e., the competencies and the test development guidelines) may require revision so that it accurately reflects the scope of practice, roles, and responsibilities of the safety professional. CRSPEX will ensure this revision takes place in a timely manner and will communicate it in updated editions of this document.

CRSPEX Examination Development Summary Chart

Examination Length and Format	190–210 **operational** multiple-choice questions. Three and a half (3.5) hours will be allocated for the completion of the examination.	
Question Presentation	Independent questions Case-based questions	65 - 75% 25 - 35%
Competency Categories and Weightings	1. Hazard and Risks: Identification and Assessment 2. Hazard and Risks: Controls and Mitigation 3. Health and Safety Management 4. Ethics, Professional Role and Function 5. Technical, Human and Social Sciences 6. Management Systems	15 - 18% 15 - 18% 30 - 35% 10 - 13% 10 - 13% 10 - 13%
Item Taxonomy	Knowledge/Comprehension Application Critical Thinking	15 - 20% 40 - 50% 35 - 40%

GLOSSARY

application: The cognitive ability to apply knowledge and learning to new or practical situations.

case-based questions: A set of questions associated with a brief scenario.

competencies: The behaviour statements which reflect the combined knowledge, abilities, skills, attitudes, and judgment expected of a registered safety professional.

criterion-referenced (C-R) examination: A test that measures the degree of command of a specified content/skills domain or list of instructional objectives. Scores are interpreted in comparison to a predetermined performance standard, or as a degree of mastery of a defined domain (e.g., percent correct and mastery scores), independently of the results obtained by other candidates. (Brown, 1983)

critical thinking: The cognitive ability level to judge the relevance of data, to deal with abstractions and to solve problems.

independent questions: Stand-alone objective examination questions which contain the information necessary for responding.

knowledge/comprehension: The cognitive ability to recall previously learned material and to understand its meaning.

operational questions: Questions appearing on the examination that have been pre-tested and that are suitable for the examination. The answer to these questions count in the candidate's score.

CRSPEX COMPETENCY PROFILE

Hazard and Risks: Identification and Assessment (HRIA)	
HRIA1	Demonstrate an understanding of causational factors related to health and psychosocial hazards, including: a. Aggression (people/animals) and violence b. Bullying and harassment c. Demographics and culture d. Fatigue e. Fitness for duty/impairment f. Impacts on wellness g. Life balance h. Organizational processes and leadership i. Psychological/Mental health j. Stress k. Workload l. Other
HRIA2	Demonstrate an understanding of causational factors related to health and safety hazards, including: a. Biological b. Chemical c. Electrical d. Environment e. Ergonomics f. Fire and explosion g. Gravitational h. Mechanical i. Noise and vibration j. Pressure k. Radiant energy l. Thermal m. Other

HRIA3	Demonstrate an understanding of the difference between hazards and risks
HRIA4	Demonstrate the use of a variety of safety techniques to identify hazards, including: a. Benchmarking b. Event tree analyses c. Fault tree analyses d. Inspections and observations e. Inventory f. Job hazard analyses g. Job safety analyses h. Monitoring i. Physical demands analysis j. Reassessment k. Task analyses l. Predictive modelling m. Other
HRIA5	Demonstrate an understanding of analysis and prioritization of risks, including: a. ALARA/ALARP b. Complexity c. Monitoring d. Probability, severity, likelihood e. Quantitative/Qualitative f. Reassessment g. Risk matrix h. Routine vs non-routine work i. Inherent and residual risks j. Other
HRIA6	Demonstrate an understanding of specific hazards, their characteristics and their mechanisms of harm, including: a. Biological b. Chemical c. Electrical d. Environment e. Ergonomics f. Fire and explosion/implosion g. Gravitational h. Mechanical i. Noise and vibration

	j. Pressure k. Psychosocial l. Radiant energy m. Thermal n. Other
Hazard and Risks: Controls and Mitigation (HRCM)	
HRCM1	Demonstrate an understanding of active and passive controls.
HRCM2	Demonstrate an understanding of the selection, implementation, effectiveness and limitations of controls.
HRCM3	Demonstrate an understanding of the use and effectiveness of the hierarchy of controls for hazards, including: a. Biological b. Chemical c. Electrical d. Environment e. Ergonomics f. Fire and explosion g. Gravitational h. Mechanical i. Noise and vibration j. Pressure k. Psychosocial l. Radiant energy m. Thermal n. Other
HRCM4	Demonstrate an understanding of workplace health promotion, including: a. Addiction control programs b. Employee and family assistance programs c. Fatigue d. Injury, illness and disease prevention programs e. Life balance f. Psychosocial work environment g. Wellness programs h. Other

HRCM5	Demonstrate an understanding of the principles of critical controls.
HRCM6	Demonstrate an understanding of design processes and workplace design, including: a. Design and procurement b. Facility design c. Human factors d. Injury prevention e. Life safety f. Process safety g. Safeguarding h. Other
HRCM7	Demonstrate an understanding of procedural and administrative controls, including: a. Communication b. Contractor management c. Inspection d. Licensing e. Signage f. Supply chain management g. Systems of work - Policies, procedures and permits h. Training and awareness i. Other
HRCM8	Demonstrate an understanding of selection, use, care, maintenance and limitations of personal protective equipment.
HRCM9	Demonstrate an understanding of emergency preparedness, including: a. Business continuity plans b. Chain of command c. Corporate crisis management d. Detection and mitigation methods e. Development of emergency preparedness plans and arrangements f. Implementation of preparedness and testing g. Relevant standards h. Other
HRCM10	Demonstrate an understanding of injury and illness management, including: a. Injury, case and claim management b. Provision of first-aid services

	c. Provision of medical services d. Role of work and the workplace in worker's recovery e. Worker's compensation, insurance and local legal requirements f. Other
Health and Safety Management (HSM)	
HSM1	Demonstrate an understanding of safety management systems.
HSM2	Demonstrate an understanding of safety management theories and accident causation.
HSM3	Demonstrate an understanding of safety management in relation to the context of the organization and other management systems, including: a. Environmental b. Financial c. Operational d. Quality e. Security f. Sustainability g. Enterprise risk management h. Insurance i. Other
HSM4	Demonstrate an understanding of the integration of health and safety, and roles and responsibilities within an organization.
HSM5	Demonstrate an understanding of the concepts of organizational and workplace culture.
HSM6	Demonstrate an understanding of how to measure and analyse organizational culture.
HSM7	Demonstrate an understanding of how to improve organizational culture.
HSM8	Demonstrate an understanding of national and international standards, and associations (e.g., ISO, CSA, ANSI, NFPA, National Fire Code, National Building Code, ACGIH, NIOSH, etc.).

HSM9	Demonstrate an understanding of the principles of law, including: a. Civil Law b. Common Law c. Compensation Law d. Criminal Law e. Employment Law f. Human Rights Law g. Privacy Law h. Product liability i. Property Law j. Tort Law k. Other
HSM10	Demonstrate an understanding of occupational health and safety law in Canada, including: a. Due diligence b. Duties and responsibilities c. Environmental legislation d. Transportation of dangerous goods (TDG) e. WHMIS/GHS f. Other
HSM11	Demonstrate an understanding of the legislated duties of workplace parties (e.g., IRS, supervisors, workers, joint health and safety committees/representatives, etc.).
HSM12	Demonstrate an understanding of worker rights (i.e., right to know, right to participate and right to refuse).
HSM13	Demonstrate an understanding of the duties and powers of enforcement agencies (e.g., orders to comply, prosecutions, ticketing, administrative penalties, the appeal process, etc.).
HSM14	Demonstrate an understanding of risk management principles.
HSM15	Demonstrate an understanding of the principles of monitoring, evaluating and validating system controls.
HSM16	Demonstrate an understanding of inspections and observations.
HSM17	Demonstrate an understanding of investigations (e.g., immediate vs root cause, causal analysis, corrective actions, control effectiveness, etc.).

HSM18	Demonstrate an understanding of surveys, surveillance and assessments (e.g., health, culture/climate, etc.).
HSM19	Demonstrate an understanding of auditing (e.g., hazard audits, compliance audits, OHSMS audits, protocols and procedures, relevant standards, etc.).
HSM20	Demonstrate an understanding of managing critical controls.
HSM21	Demonstrate an understanding of performance indicators (e.g., qualitative, quantitative, leading and lagging, trending, etc.).
HSM22	Demonstrate an understanding of benchmarking.
HSM23	Demonstrate an understanding of processes for selecting tools for monitoring, evaluation and validation.
HSM24	Demonstrate an understanding of data collection and analysis techniques.
HSM25	Demonstrate an understanding of how to develop action plans for findings.
HSM26	Demonstrate an understanding of internal and external requirements for information management (i.e., document control, reporting, data security).
HSM27	Demonstrate an understanding of organizational channels of communication and consultative mechanisms, including: a. Barriers to communication b. Formal and informal c. Internal and external d. Management committees e. Safety committees f. Steering committees g. Other
Ethics, Professional Role and Function (EPRF)	
EPRF1	Demonstrate an understanding of ethical theories, models of ethical practice and ethical decision-making (e.g., utilitarianism, Kantianism, natural law, conflicting goals, etc.).
EPRF2	Demonstrate an understanding of the obligations of a CRSP (e.g., with respect to employers, co-workers, public, fellow professionals, contractors, etc.).
EPRF3	Demonstrate an understanding of the CRSP's obligations with respect to *The BCRSP Code of Conduct*.

EPRF4	Demonstrate an understanding of consequences of professional liability, errors and omissions.
EPRF5	Demonstrate an understanding of the role of the CRSP and limits of professional practice (e.g., interaction with government agencies, scope of practice, boundaries of competence, etc.).
EPRF6	Demonstrate an understanding of corporate governance.
EPRF7	Demonstrate an understanding of corporate social responsibility and sustainability (e.g., health and safety indicators, resource conservation, resource management, etc.).
EPRF8	Demonstrate an understanding of the role of specialists (e.g., auditor, ergonomist, occupational hygienist, occupational therapist, occupational health nurse, etc.).
EPRF9	Demonstrate an understanding of research methodologies related to health and safety and evidence-based practice.
Technical, Human and Social Sciences (THSS)	
THSS1	Demonstrate an understanding of basic principles of human anatomy, physiology and biomechanics.
THSS2	Demonstrate an understanding of the basic principles of toxicology.
THSS3	Demonstrate an understanding of mechanisms and prevention of musculoskeletal injuries.
THSS4	Demonstrate an understanding of human factors and their impact on performance (i.e., people, workplace, management).
THSS5	Demonstrate an understanding of occupational illness and disease (e.g., asthma, chemical and environmental sensitivity, dermatitis, cancer, etc.).
THSS6	Demonstrate an understanding of how social factors in the workplace impact worker and organizational well-being (e.g., culture, group norms, peer pressure, biases, multiple generations, diversity, aging workforce, etc.)
THSS7	Demonstrate an understanding of human psychology principles (e.g., organisational and industrial psychology, behavioural psychology, neuropsychology, psychomotor, motivation, personality, cognitive psychology, etc.)

THSS8	Demonstrate an understanding of conflict management.
THSS9	Demonstrate an understanding of statistics and quantitative analysis (e.g., mean, percentage, standard deviation, time weighted average, etc.).
THSS10	Demonstrate an understanding of occupational hygiene measurement and sampling (e.g., air, noise, radiation, chemical, etc.).
THSS11	Demonstrate an understanding of ventilation (e.g., local, general, supply, exhaust, etc.).
THSS12	Demonstrate an understanding of occupational exposure limits (e.g., Threshold Limit Values (TLVs), Biological Exposure Indices (BEIs), action levels, etc.).
THSS13	Demonstrate an understanding of new and emerging technology (e.g., artificial intelligence, monitoring devices, Internet of Things (IoT), autonomous or remotely controlled equipment and technology, etc.).
THSS14	Demonstrate an understanding of material/process/workflow analyses.
Management Sciences (MS)	
MS1	Demonstrate an understanding of engagement, influence and communication techniques (e.g., emotional intelligence, interpersonal skills, etc.)
MS2	Demonstrate an understanding of leadership styles (e.g., directive, supportive, consultative, etc.).
MS3	Demonstrate an understanding of problem-solving processes.
MS4	Demonstrate an understanding of the integration of health and safety into organizational structure, function, culture and design.
MS5	Demonstrate an understanding of the functions of management (e.g., planning, organizing, leading, measuring performance, controlling, resources, etc.).
MS6	Demonstrate an understanding of financial and business processes (e.g., budgeting, business case development, management by objectives, policy and procedure development, etc.).
MS7	Demonstrate an understanding of labour relations.
MS8	Demonstrate an understanding of strategic planning.

MS9	Demonstrate an understanding of change management.
MS10	Demonstrate an understanding of training needs analyses (e.g., development, delivery and evaluation, etc.).
MS11	Demonstrate an understanding of project management.